

META COGNITIVE ENVIRONMENT: NEED OF 21ST CENTURY

POONAM SHARMA & NISHA MISHRA

Assistant Professor Bhavan's Leelavati Munshi College of Education, New Delhi and
A Research Scholar, Mewar University, India

ABSTRACT

"Although thinking is innate, skillful thinking must be cultivated." (Art Costa) The structures and functionality of our society is rapidly changing with the development of technology and we find that in today's context many skills and values of the past are no longer relevant. The students of our society must be prepared for accepting the challenges of multidimensional domains. It is the primary job of the educator to ensure that the art of thinking is being valued, encouraged, and challenged in the classroom. The ability of interpersonal and intrapersonal management of learning tasks involves a constant process of self-evaluation and modification in both the cognitive process and learning outcomes. So it is the utmost demand of the 21st century workforce to produce innovative, motivated, technically skilled critical thinkers who can both recognize problems and find solutions and give further suggestions along with educational implications.

The ability to think about one's thinking is what neuroscientists call metacognition. Metacognition is the process of thinking that represents productive thoughts of the convergent, divergent and evaluative thinking. It may be defined as having knowledge of one's own different intellectual operations. Strategies are the techniques employed to foster development of learning skills. Both traditional metacognitive strategies and those that have been developed and researched lay emphasis on offering different ways of helping students to use technology based on metacognition as a learning tool. It is important to remember that each student has unique creative intelligence thus, every effort should be grasped to select and adapt strategies to each individual's abilities, learning styles, and learning preference. In this rapidly changing world, the challenge of teaching is to help students develop those skills and values that will not become obsolete in future.

For centuries we have been conditioned by nationality, caste, class, tradition, religion, language etc. and every influence we can think of and therefore our responses to every problem are conditioned. A metacognitive environment inculcate higher order thinking skills to emphasize critical thinking in removing the influences of responses that are already conditioned. Planning and organizing of metacognitive skills must be shared between teachers and students so that metacognitive environment could be created. In the metacognitive environment teachers monitor and apply their knowledge and deliberately modeling metacognitive behavior to assist students in becoming aware of their own thinking. Use of Metacognitive strategies in teaching learning process is essential for the twenty first century because these strategies may enable the students to cope successfully with new challenges of the modern world. This study assumes greater significance of using metacognitive skills in achieving constructive learning.

KEYWORDS: Metacognition, Metacognitive Strategies and Metacognitive Environment

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INTRODUCTION

The concept of “Metacognition” was first introduced by Ann Brown and John Flavell around thirty years ago to the American research literature (Brown, 1975; 1978; 1987; Flavell, 1976; 1979; 1982). Since then the research literature on metacognition has flourished, and it has moved from a context that is primarily laboratory based to one that also involves the creation of social support in classroom environments that foster metacognitive reflection (e.g., Brown, 1997; Brown & Campione, 1996; Scardamalia & Bereiter, 1996; Vye, Schwartz, Bransford, Barron, & Zech 1998; White & Frederiksen, 1998). It is almost known to most of the teachers that maintaining diaries of reflections on the learning of the students make them an effective learner or reflective practitioner. So it should become mandatory for all the students of different learning styles to reflect on their thinking so that different strategies of learning could be explored. For example the students of mathematics may have different learning styles than the learner of languages as their thinking style varies. As they think differently their reflections will be different which will lead to creation of different metacognitive environment equipped with different strategies for different learners. Students may learn to regulate their behaviour to optimize learning through the awareness towards their own process of thinking. Through the process of metacognition they will be in the position to critically analyse, synthesize and evaluate their own thinking and They begin to see how their strengths and weaknesses affects their performance.

This manuscript will be helpful for all the stakeholders of Education System who want to prevail a sound metacognitive environment throughout the world. Metacognitive Environment includes *teaching for metacognition* and *teaching with metacognition*.

The main focus of *teaching for metacognition* is to make child self directed and self reflective learners who must know where to use metacognitive strategies. He should always in the process of thinking, rethinking and so on.

Teaching with metacognition focuses more on the reflecting on the approaches, strategies and methodologies of teaching and the outcomes of the classroom situation. But in both process a teacher and a student should be a reflective practitioner.

Strategies that Improve Metacognition

- **Development of a Continuous Learning Mindset Rather Than a Fixed Mind Set**

It should be the motto of all teaching learning institutes worldwide to develop the mindset of continuous learning instead of fixed mindset. When the students and teachers engaged themselves in continuous learning mindset they will definitely become a reflective practitioner as they use metacognition in continuous learning which will help them to understand how can they grow their own brains.

- **Acknowledgement of Confusion Should Become an Integral Part of Learning**

Self awareness can be developed if one is able to identify one’s lack of understanding in cognitive, affective and psychomotor domain of learning. So confusion and raising questions should be highly acknowledged to be an integral part of learning. The most confusing task must be accepted as a challenge which will help in exploring new solutions through metacognitive processes. So metacognition should become the daily activity of each and every class. But proper time should be allocated to each and every individual in creating metcognitive environment.

- **Screenings and Course Work Should be Reflected**

Opportunities to reflect on learning will definitely foster Higher-order thinking skills which in turn help the students to recognize their own cognitive growth. Questions that help this process might include:

- How has my thinking towards the screening of Battle for Schools changed since taking the course of knowledge and Curriculum.
- Before this Screening of Audio I thought students were dropping out but now I understand that education system is not flexible enough to accommodate each and every student irrespective of their class.

- **Writing of Reflective Journals**

Students must be motivated to write reflective journals focusing more on 'How they learn' rather than 'what they learn'. Through their reflections they will monitor their own learning. Monitoring learning enhances thinking & rethinking which automatically takes the child to the zone of metacognition. Creative intelligence is essentially required for right to enlightenment. A child may be enlightened if he pays proper attention because wherever the attention goes divine energy flows. So more and more attention should be emphasized on writing reflections through metacognition.

- **Ask Students to Identify Either the Muddiest, Most Interesting, or Most Relevant Point(S)**

Feedback system and peer group observation in collaborative learning may integrate metacognitive practices. Students or peers must be asked to identify the muddiest, most interesting and most relevant points of work at each level of projects. Later that identification of several points should be matched after reaching at the final stage of project completion. This activity not only increases learning but also improves meta cognitive self monitoring and peer monitoring skills.

- **Consider Essay Type Exams for Improving Higher Level of Thinking**

Practice of writing short essays will be helpful in enhancing metacognitive skills among students of upper primary stages. Several short answer type question gives the chance to reflect on their own thinking. Several Research reveals that higher level metacognitive skills are used to prepare for Long answer type questions.

- **Facilitate Flexible and Adaptive Thinking**

Flexible and adaptive thinking is a part of metacognitive processes which spreads awareness among the learners towards the prejudices. The formula of Think-Watch-Learn should be adopted which in turn develops new formula i.e Rethink-Rewatch-Relearn. This type of culture can be created at home and in school so that flexible and adaptive thinking is facilitated to challenge societal biases. They begin to challenge their own biases and become more flexible and adaptive thinkers.

Instructional Strategies to Foster Metacognitive Thinking

- **More Emphasis on Diagnostic Quizzes:** Diagnostic quizzes takes the child from their previous knowledge to their destined knowledge. Such type of questions should be framed that prompt the students to think about their own learning.
- **Use of Concept Map and a Mind Map:** Use of Concept mapping and mind mapping is an integral part of metacognitive strategies. More opportunities should be given to students to explore the ideas and thoughts and

integrate them with their experience to draw a concept map and a mind map.

- **Use a "Wrapper" to Increase Students' Monitoring Skills:** In this activity students are required to wrap their learning by finding out the muddiest, the most interesting and the most relevant points in lectures. Through this activity students get themselves engaged in creating the metacognitive environment by monitoring their own thinking.
- **Link the Purpose of an Assignment to Course Objectives and Professional Skills:** Students must be in a position to correlate the objectives of any course with the professional skills. Through this integration they must acquire an ability to articulate their thoughts.

What other ways do you help students reflect on their thinking in your classroom?

Doctrine 1: Provide frequent opportunities for students to self-assess what they know and do not know. Engage students in metacognitive activities that will help them to assess themselves and to explain specifically both what they know and what they do not know. By identifying what they do not know, students can focus their attention and resources toward resolving such difficulties (Bielaczyc et al., 1995; King, 1992; Lin & Lehman, 1999). In addition, by knowing what they already know, students become aware of the potential knowledge and skills that they can bring to bear, which provides them with more confidence in learning (Lambert & McCombs, 1998; Zimmerman, 1998). This has become a guiding principle for most strategy-training programs, particularly for domain-knowledge acquisition. For example, the 1995 study of Bielaczyc et al. used good student models to teach effective self-control strategies to help people monitor what they know and what they do not know

Doctrine 2: Foster a shared understanding of the goals for metacognitive activities. Researchers suggest that students who are aware of the value and usefulness of metacognitive activities in problem solving are usually more willing to engage in these activities in future learning (Brown & Campione, 1996; Coleman, Brown, & Rivkin, 1997; King, 1992; Zimmerman, 1998). That is, "informed" training is much more powerful than "blind" training (Brown et al., 1983). Most programs that consider creating social supports for domain learning value the importance of helping all the members of a community to know why specific metacognitive activities are needed and when they should be used.

Doctrine 3: Help students articulate their own thinking. Developing knowledge about the self-as-learner through metacognitive activities involves helping students acquire an ability for articulating their thoughts and emotions. Metacognitive strategy-training programs that consider the self-as-learner emphasize the importance of providing students with supports for explaining and justifying their thinking (e.g., Zimmerman, 1998; Zimmerman & Kitsantas, 1999). King's (1992) study used guided questions to help students express where they were in the thinking and learning process (e.g., King, 1992). Chi et al. (1994) used prompts to help students self-explain their understanding of the science text. Bandura (1997) and Zimmerman employed social modeling to foster student ability to articulate personal goals for learning. These studies suggest that students do not spontaneously explain their thinking during the process of learning unless they are encouraged to do so. Explaining where they are in the learning process is important in making thinking explicit

Doctrine 4: Develop knowledge of the self-as-learner with respect to one's role in a specific culture. Programs that consider the self-as-learner in creating social supports often explicitly focus on helping students learn about themselves with respect to the specific roles they choose to take on in a given culture. Researchers suggest that it is

important for students to reflect on academic content, as well as on the learner characteristics and personality dimensions that interact with content learning (e.g., Lin, Schwartz, et al., 1999). For example, if we know that certain personal habits (e.g., not listening to others, not asking questions, etc.) may interfere with a specific role we take on, we are more likely to work on these personal weaknesses. Most of the research programs that attempt to create supportive social environments recognize the importance of helping students identify their strengths and the limits of their ability to learn. When students can make these identifications, they are able to uncover some key beliefs and assumptions that may be getting in the way of their learning. They start to realize how their attitudes and beliefs about both themselves and their learning situations affect their learning and problem-solving performance. This suggests that understanding oneself as a learner may increase confidence and motivation for learning, which in turn affects the kinds of learning goals and feedback that one is seeking (e.g., Zimmerman, 1998; Zimmerman & Martinez-Pons, 1986). For example, White and her colleagues achieved this principle by creating choices of roles for students to take on (White et al., 1999). In summary, most strategy-training interventions provide students with frequent opportunities to assess what they know or do not know with respect to a specific domain

(Principle 1): Strategy training that considers the self-as learner in metacognition emphasizes a need to help students acquire an ability to articulate their own thoughts

(Principle 2): Interventions that create supportive social environments for domain-specific learning stress the importance of achieving a shared understanding among community members for why metacognitive activity is useful

(Principle 3): Interventions that attempt to reach the self-as-learner by creating social supports argue for the importance of helping students know who they are with respect to the role they take on in a specific task and social context

(Principle 4): Together, these principles may provide general guidance for design decisions at a systems level. Whether these principles are valid for all designs and social settings is an important question for future research. We have only a beginning understanding of how to provide balanced metacognitive supports both at a classroom and personal level. In addition, the kinds of support that teachers need in mediating student metacognitive activities should also be explored.

Importance of Building Knowledge about the Self-as-Learner and Creating a New social Environment for Metacognition: Our knowledge of self-as-learner is often derived from roles we take on in a culture or a social practice (Lave & Wenger, 1991; Lin, 2001; Schwartz & Lin, 2001). How we define ourselves is usually influenced, to a certain degree, by whom we are with and in which cultural context we situate ourselves. For example, when we are put into the role of being a teacher, we have different perceptions about ourselves than we do in the student role. The key point is that our knowledge about the self-as-learner is often situational or cultural-bound (Boekaerts, 1998; Ferrari & Mahalingam, 1998). Therefore, it is difficult to imagine that changes of social structure in a classroom or a school will not affect our knowledge about the self-as-learner and how others perceive us as learners. It is apparent that interventions, which involve creating new social environments for metacognition, have brought changes to the roles learners play in their environments.

Creating Supportive Metacognitive Environments: Seems to have a greater effect on people's knowledge about self-as-learner than does mere strategy training. As learner roles shift, changes in students' personal knowledge about the self-aslearner seem inevitable. Changing social environments bring great opportunities for metacognition, as well as challenges in design and implementation. There is research showing that people tend to engage in more self-reflection when their knowledge of the self-as-learner in routine practice is disturbed (Lin, 2001). People have a desire to regain a

coherent knowledge about the self-as-learner, and to make recognizable contributions to a new environment (Lin, 2001; Neisser, 1988). We have only a beginning understanding of how instruction can be designed to support teachers and students in adapting to these changes, at both an individual and a classroom level. Special attention should be given to how to support teacher and student role shifting and the subsequent psychological consequences when creating new social environments. Interventions may fail to develop a strong sense of the self-as-learner in the absence of appropriate support. It would be interesting to design various kinds of instructional systems either at a domain-specific or personal level for role shifting, and study their impact on students' knowledge of the self-as-learner.

It would be equally important to explore how different classroom cultural parameters (e.g., learning goals, feedback, reward systems, social activity structures, choices, etc.) might support or hinder the development of domain knowledge and knowledge about the self-as-learner. A related issue is the role of technologies in support of development of knowledge about self-as-learner. A majority of these metacognitive interventions make use of new technologies, such as video, multimedia materials, and Internet interactions. As new computer technologies become more available in schools and become part of new social learning environments, research questions surrounding effective ways to support the new social roles taken on by both teachers and students will continue to arise. One area for investigation can be on the design and use of new technologies for capturing, on-line or on video, a student's own learning approaches. As suggested by Lin and her colleagues (Lin, Hmelo, et al., 1999), different technologies, such as video, computers, or network programs, can provide powerful scaffolds for reflection by displaying, prompting, and modeling one's own or other's learning processes, as well as providing a forum for reflective social discourse. Such recordings and externalization of the learning process objectify one's growth path, making one's thinking more available for self-reflection or reflection with others (Collins & Brown, 1988; Lin, Hmelo, et al., 1999). In all of the issues discussed earlier, teachers are the key players in fostering student engagement in different roles. They contribute significantly by creating and mediating various design features that afford students opportunities to develop knowledge about the self-as-learner, to identify learning goals, and to pursue their personal interests in meaningful ways. How best to help teachers in support of student knowledge about the self-as-learner remains a challenge.

CONCLUSIONS

In this article Researcher have examined ways to design effective metacognitive activities. The discussions are organized around two approaches to supporting metacognition: (a) strategy training and (b) the creation of a supportive social environment for metacognition. The underlying instructional goals and design characteristics for each approach are analyzed with regard to two kinds of content that are taught: (a) knowledge about a specific domain and (b) knowledge about the self-as-learner. It is important to view metacognitive activities not simply as domain skills, nor as ways to build knowledge about the self-as-learner, but rather as habits of mind for developing a balanced cognitively and socially competent learner. This implies that engaging in such activities should be an integrated, natural part of the learning process rather than an add-on procedure. Habits of mind should have strong links to domain-specific knowledge, personal and cultural values, the language, and the tools of the learning environment, in order to be more accessible and long lasting. This approach to metacognition can be better supported by coordinating between strategy training and creating sociocultural support for domain-specific and personal growth in everyday classroom activities. Such a balanced approach to metacognition is both possible and beneficial, based on insights from the exemplary programs created in American cultural settings as well as from cross-cultural studies (e.g., Hatano & Inagaki, 1998; Lin & Hatano, in press; Sato &

McLaughlin, 1992). For example, both Chinese and Japanese schools emphasize metacognitive reflection as “authentic daily habits” engaged in by learners throughout the course of their schooling. Viewed as habits of mind, metacognitive activities are always embedded in the daily process of teaching, learning, and other community activities, such as parent meetings, morning refreshments at school, and music (Lewis, 1998; Lin, 2001; Sato, 1997). They are not treated as separate or isolated activities. An emphasis on a balanced system design centered around metacognitive activities is of importance in developing cognitively and socially competent learners. Many teachers have told us their classrooms have become more positive, even joyful, as students more often experience those "aha!" moments of learning that come from thinking about their thinking. In addition, educators report that teaching with metacognition has helped transform their classroom practice and attitude about their profession. As one teacher put it, "My students now have a teacher who has the strategies and tools to help them learn to think metacognitively and to teach the 'how' to become successful in school and in their personal lives."

Let's learn from each other. Take learning about how we learn to the next level thinking about thinking with others

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